

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SEDIMENT BASIN

(No.)

Code 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSES

To preserve the capacity of reservoirs, ditches, canals, diversions, waterways, and streams; to prevent undesirable deposition on bottom lands and developed areas; to trap sediment originating from construction sites; and to reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural wastes, and other detritus.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion control measures to keep soil and other material in place, or where a sediment basin offers the most practical solution to the problem.

CRITERIA

General. The capacity of the sediment basin shall equal 1 ½ times the volume of sediment expected to be trapped at the site during the planned useful life of the basin or the improvements it is designed to protect. If it is determined that periodic removal of debris will be practicable, the capacity may be proportionately reduced.

Classification. Sediment Basins shall be classified as follows:

- Class I –
1. Drainage Area, 5 acres or less.
 2. No permanent pool.
 3. Embankment effective height 5 feet or less.
 4. Temporary basin.

Class II – Any sediment basin exceeding one or more of the criteria for Class I sediment basins.

Class I Basins

The minimum capacity shall be that required to store all of the runoff from a 10-year, 24-hour storm from the contributing drainage area plus the required sediment storage.

The embankment shall have a minimum top width of 4 ft and side slopes of 2:1 or flatter

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An outlet shall be provided of earth, pipe, stone, or other devices adequate to keep the sediment in the basin and to handle the 10-year frequency discharge without failure or significant erosion. Outlet conduits shall meet the standard and specifications for Ponds (378).

The detention time of the basin affects the efficiency of sediment removal from the incoming runoff. The minimum detention time should be 24 hours. This may be met by providing a maximum design outflow of 0.025 c.f.s. per acre-inch of runoff. Longer detention times are encouraged where practical or necessary to meet downstream water quality.

An emergency spillway is not required. A maximum of one foot may be added to the design height across the central storage area to provide for an emergency spillway around one or both ends of the embankment.

Class II Basins

The basin may be either a wet type or dry type. The principal spillway and drawdown if used, shall be proportioned such that the inflow from a 10-year, 24-hour storm is detained a minimum of 24 hours.

Other Provisions

Provisions are to be made for draining sediment pools if necessary for safety and vector control. Fencing and other safety measures shall be installed as necessary to protect the public from floodwater and soft sediment. Fencing shall be according to NRCS Standard Fencing (382).

The design of dams, spillways, and drainage facilities shall be according to NRCS standards for Ponds (378) and Grade Stabilization Structures (410) or according to the requirements in TR-60, as appropriate for the Class II and kind of structure being considered.

Other Factors to Consider to Improve Efficiency

Provisions at the entrance of a basin to reduce velocity of inflow.

Attempt to achieve a basin flow length to width ratio of 5 to 1.

Use a siphon arrangement in a non-perforated riser pipe.

Locating inflow and outflows as far apart as possible to prevent short-circuiting.

The use of baffles within the basin to help utilize the whole basin.

CONSIDERATIONS

Sediment basins should be part of the treatment needed to protect the soil, water, plants, animals and air resources. The management system must be planned to prevent excessive maintenance and operation problems.

Effects on water quantity and quality shall be considered. Sediment basins are a flow through type structure and are designed to detain the runoff, but not to store it. Therefore, the structure will not decrease the amount of surface runoff water delivered downstream, but will delay the time it takes the runoff to reach the downstream areas. There may be an increased recharge to ground water, depending on the time of detention, the permeability of the bottom of the basin, and the age of the structure.

If the basin has been in place a long enough time to collect a considerable amount of organic material in the bottom, and the bottom tends to remain wet; the bottom may be nearly impermeable. In this situation, there will be only small amounts of water percolating to beneath the basin.

Sediment basins will retain sediment, sediment associated materials and other debris from the water. Due to the detention of the runoff in the basin, there is an increased opportunity for soluble materials to be leached toward the ground water.

Special attention shall be given to maintaining and improving visual resources and habitat for wildlife where applicable. The landowner/user shall be advised if wetlands will be affected and USDA-NRCS wetland policy will apply. All work planned shall be in compliance with General Manual Title 450-GM, Part 405, Subpart A, Compliance with Federal, State, and Local Laws and Regulations. If archaeological and historical properties are encountered, the USDA-NRCS policy in General Manual Title 420-GM, Part 401 shall be followed.

PLANS AND SPECIFICATIONS

Plans and specifications for installing sediment basins shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Construction of sediment basins within the scope of the standard for Ponds (378) shall have, as a minimum, specifications commensurate with those for Ponds (378). Those within the scope of TR-60 shall be in accord with the guide specifications contained in the National Engineering Handbook, Section 20.

OPERATION AND MAINTENANCE

A maintenance program shall be established by the landowner/user to maintain capacity and vegetative cover. Items to consider are:

1. Do not graze protected area of embankment and pond.
2. Fertilize to maintain a vigorous vegetative cover in protected area.
3. Mulch, spray or chop out undesirable vegetation periodically to prevent growth of large woody-stemmed weeds, water plants such as cattails or trees (such as willows) from embankment and spillway areas.
4. Promptly repair eroded areas.
5. Promptly remove any burrowing rodents that may invade area of embankment.

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6. Reestablish vegetative cover immediately where scour erosion has removed established seeding.
7. Keep open all spillways and remove trash that may accumulate around entrance.
8. Remove sediment from basin when volume of sediment storage becomes depleted.
9. Periodically inspect area for any new maintenance items and if any observed take immediate action to protect from further damage or deterioration.

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION**

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